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10/763,979	01/22/2004	George Hradil	81394-499	7882

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EXAMINER

WONG, EDNA

ART UNIT	PAPER NUMBER
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1753

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/763,979
Filing Date: January 22, 2004
Appellant(s): HRADIL, GEORGE

Allan A. Fanucci
For Appellant

EXAMINER'S ANSWER

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This is in response to the appeal brief filed September 19, 2006 appealing from
the Office action mailed February 22, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2-301588

TORU

12-1990

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **19 and 21-37** are rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 2-301588 ('588)**.

DE '588 teaches a method for electroplating a metal deposit on a substrate which comprises contacting a plurality of such substrates with a solution which comprises:

- (a) water;
- (b) a metal ion (page 2, line 42 to page 3, line 4) in an amount (= in the range of 0.5~200 g/l) [page 3, line 5-6] sufficient to provide a metal deposit (= metal tin, lead, tin-

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lead alloy or the combination of metals of the corresponding film deposit) on a platable substrate (= to plate any parts that can be electrically plated) [page 4, lines 31-35];

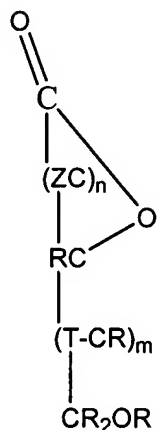
(c) a complexing agent (= complexers) of an organic compound having between 4 and 18 carbon atoms which compound includes at least two hydroxyl groups and a five or six membered ring that contains at least one oxygen atom (page 3, lines 7-11), with the compound being present in an amount (= in the range of 3~800 g/l) [page 3, lines 12-13] sufficient to complex the metal to render it soluble in the solution and to inhibit oxidation of the metal; and

(d) a pH of the solution in the range of between 3.5 and 5.5 (= pH 2~9) [page 4, lines 13-15], adjusted, if necessary, by the addition of a suitable pH adjusting agent (= pH buffer) [page 3, lines 25-29]; and

(e) passing a current (= $0.001\sim30\text{ A/dm}^2$) though the solution to provide metal electrodeposits on the substrates (page 4, lines 22-35) without causing significant agglomeration of such substrates during the electroplating (*inherent*) [= barrel plating] (page 4, lines 22-23);

wherein the substrates are composite articles having electroplatable and non-electroplatable portions (= metal/ceramic and metal/glass composite substrates) [page 4, lines 33-35].

The complexing agent has the structure:



wherein each R is the same or different and is hydrogen or a lower alkyl group of 1 to 3 carbon atoms, T is R, OR, or $\text{O}=\text{P}(\text{OR})_2$ -, Z is $\text{O}=\text{}$ or $\text{RO}-$, n is 2-4 and Z can be the same or different in each occurrence in the compound, and m is 1-3, or the complexing agent is a soluble salt of such structure (= ascorbic acid, 2-ketogluconic acid, and glucuronic acid) [page 3, lines 7-11].

The complexing is ascorbic acid, isoascorbic acid, dehydroascorbic acid, glucoascorbic acid, galacturonic acid, glucuronic acid, or a salt thereof, or is derived from a ketogluconate or heptagluconate (= ascorbic acid, 2- ketogluconic acid, and glucuronic acid) [page 3, lines 7-11] and is present in an amount of about 25 to 200 g/l (= in the range of 3~800 g/l) [page 3, lines 12-13].

The metal ion is a tin ion and is added to the solution as a stannous alkyl sulfonate salt, a stannous sulfate salt, a stannous chloride salt, a stannous ascorbate salt, or stannous oxide (= tin sulfate, tin chloride, tin methane sulfonate, and tin oxide) [page 2, line 42 to page 3, line 4] and is present in an amount of between about 5 and 100 g/l (= in the range of 0.5~200 g/l) [page 3, line 5-6].

The metal ion includes a divalent lead salt (page 3, lines 3-4) in an amount sufficient to deposit a tin-lead alloy from the solution (= in the range of 0.5~200 g/l) [page 3, line 5-6; and page 4, lines 31-32].

The solution further comprises a conductivity salt (page 3, lines 19-23) in an amount (= 0~800 g/l) [page 3, lines 23-24] sufficient to increase the conductivity of the solution.

The conductivity salt is an alkali or alkaline metal sulfate, sulfonate, or acetate compound (= sodium sulfate) [page 3, lines 19-21].

The solution further comprises a surfactant in an amount (= 0.01~30 g/l) [page 3, lines 41-43] sufficient to enhance deposit quality and grain structure.

The surfactant is an alkylene oxide condensation compound (page 3, lines 33-38) and is present in an amount of about 0.01 to 20 g/l (= 0.01~30 g/l) [page 3, lines 41-43].

The pH adjusting agent is an acid or a base (page 3, lines 25-29) and the pH is adjusted to the range of about 3.5 to 5.5 (= pH 2~9) [page 4, lines 13-15] to enable electroplating of the electroplatable portions of the articles without deleteriously affecting the non-electroplatable portions (*inherent*).

The method of JP '588 differs from the instant invention because JP '588 does not disclose the following:

- a. Wherein the complexing agent and metal ion are present in a

concentration ratio of between about 2:1 and 9:1 to reduce or minimize agglomeration of the substances during electroplating, recited in claims 19 and 32.

JP '588 teaches that the tin and lead ion concentration can be selectively arbitrarily, normally in the range of 0.5~200 g/l, but preferably in the range of 1~100 g/l (page 3, lines 5-6). The complexers addition quantity may vary but normally in the range of 3~800 g/l, and preferably in 40~400 g/l (page 3, lines 12-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the concentration ratio of the complexing agent and metal ion described by JP '588 with wherein the complexing agent and metal ion are present in a concentration ratio of between about 2:1 and 9:1 because one having ordinary skill in the art would have adjusted the concentration ratio of the complexing agent and metal to maintain the tin and lead metals in solution at the preferred pH values. Thus, the concentration ratio of the complexing agent and metal ion is a result-effective variable and one skilled in the art has the skill to calculate the concentration ratio that would have determined the success of the desired reaction to occur, i.e., to maintain the tin and lead metals in solution at the preferred pH values, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(II)(B).

JP '588 teaches 10 g/l stannous methane sulfonate and 100 g/l ascorbic acid (page 4, Example 1); and 10 g/l stannous methane sulfonate and 200 g/l dehydro ascorbic acid (page 5, Example 2).

As to reducing or minimizing agglomeration of the substances during

electroplating, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert. denied*, 500 US 904 (1991); and MPEP § 2144.

b. Wherein the solution further comprises an agent to promote anodic dissolution, as recited in claim 29.

c. Wherein the agent to promote anode dissolution is as potassium methane sulfonate, ammonium chloride or a metal sulfide salt, as recited in claim 30.

JP '588 teaches ammonium chloride as a conductive salt (page 3, lines 19-21).

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention because the Applicant has a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

(10) Response to Argument

Claim Rejections - 35 USC § 103

Claims **19 and 21-37** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **JP 2-301588** ('588).

The rejection of claims 19 and 21-31 under 35 U.S.C. 103(a) as being unpatentable over JP 2-301588 ('588) has been maintained for the following reasons:

Applicant states that the general disclosure of the amounts of metal ions and complexors, which can be selected arbitrarily, is not a disclosure or suggestion to use these two components in any specific relative concentration ratio.

In response, claims 19 and 32, lines 12 and 14-15, respectively, recite "a pH of the solution in the range of between 3.5 and 5.5" and "wherein the complexing agent and metal ion are present in a concentration ratio of between about 2:1 and 9:1".

JP '588 teaches that the best pH was at 5~8 (page 4, lines 13-15). Thus, a **pH 5 to 5.5** were obvious.

JP '588 teaches that the tin and lead ion concentration can be selectively arbitrarily, normally in the range of 0.5~200 g/l, but preferably in the range of 1~100 g/l (page 3, lines 5-6). The complexers addition quantity may vary but normally in the range of 3~800 g/l, and preferably in 40~400 g/l (page 3, lines 12-13). Thus, a concentration ratio of the complexing agent and metal ion of at least **4:1** was obvious.

The Examiner deems that these are specific teachings of a specific ratio of the two components as disclosed or suggested in JP '588. The general disclosure of the

amounts of metal ions and complexors would not have been selected so arbitrarily with such a disclosure or suggestion to use these two components in the preferred specific relative concentration ratio.

Applicant states that the wide ranges of amounts of complexors and metal ions in JP '588, even if allegedly encompassing the recited ratio, do not provide any suggestion to use the specific ratio of between 2:1 and 9:1, which have been found to provide unexpected reduction of substrate agglomeration during electroplating.

In response, given the preferred ranges of complexer and metal ions disclosed by JP '588, Applicant has not shown that, for example, a pH of 5 and a concentration ratio of 4:1 (see above), would have not provided the unexpected reduction of substrate agglomeration during electroplating.

Applicant states that the concentration ratios of the complexors to metal ions disclosed in the examples of JP '588 far exceed the ratio recited in the present claims, at about 10:1 to 20:1. (See JP '588, Examples 1-5).

In response, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiment (MPEP § 2123).

Applicant states that the criticality and importance of specific relative concentrations of complexing agents and metal ions are explained in the application as

well as the Rule 132 declaration submitted by the inventor Dr. George Hradil, dated May 22, 2006 ("Declaration").

In response, the tests carried out to repeat example 1 of JP '588 were outside of the preferred ranges disclosed by JP '588. What would happen if these tests were carried out in the best/preferred ranges disclosed by JP '588?

Applicant states that the Examiner's statements that the preferred ranges of metal ions and complexors disclosed in JP '588 would have led a skilled artisan to use values in the recited range and that the examples and embodiments disclosed in JP '588 do not constitute a teaching away from a broader disclosure or nonpreferred embodiment are incorrect. (See Office Action dated February 22, 2006, at pp. 4-5). As explained above, the wide ranges of the amounts of complexors and metal ions mentioned in JP '588 would not have led a skilled artisan to use a complexor and metal ions in relative concentrations falling within the specific recited ratios. Also as explained above, the examples disclosed in JP '588, all of which have complexor to metal ion concentration ratios outside the recited range, would not have led a skilled artisan to use those components in concentrations falling within the specific recited ratios.

In response, the Examiner maintains that where the claimed ranges overlap or lie inside ranges disclosed in the prior art, a *prima facie* case of obviousness exists (MPEP § 2144.05).

Applicant states that the general disclosure of a wide pH range of 2 to 9 in JP '588 is not a disclosure or suggestion to only use a pH between 3.5 and 5.5.

In response, the disclosure of "best at pH 5~8" in JP '588 (page 4, lines 13-15) is a disclosure or suggestion to use a pH of 5 or 5.5 only for the best results.

Applicant states that the specifically required combination of the pH range and the concentration ratios is a critical feature of the claimed method, which allows reduction of substrate agglomeration while also minimizing attack on the non-electroplatable portions of composite substrates during electroplating.

In response, JP '588 teaches that the baths of the invention were able to obtain a good plating deposit, and during its plating the baths of these did not attack the parts made of ceramic, lead glass, and vacuum deposited aluminum composite substrates, with high current efficiency, and usable over the wide current density range (page 2, lines 32-35).

The Examiner maintains that the Applicant has a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

And that a *prima facie* obviousness is not rebutted by merely recognizing additional advantages or latent properties present in the prior art (MPEP § 2145 (II)).

Applicant states that the solution recited in the claimed method, with its combination of a specific pH range and complexing agent/metal ion concentration ratios, is further distinguished from JP '588 by its superior stability properties.

In response, JP '588 teaches that plated tin or tin-lead alloy in the bath at the pH of 2-9 without precipitating tin or lead hydroxides with stability (page 2, lines 30-32).

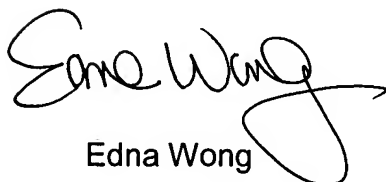
The baths disclosed by JP '588 were stable.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

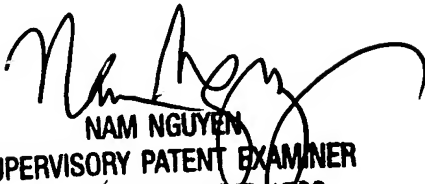

Edna Wong

Conferees:

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Kathryn Gorgos